

## ABSTRACT

The present invention provides new high resolution resists applicable to next generation lithographies, methods of making these novel resists, and methods of using these new resists in lithographic processes to effect state-of-the-art lithographies. New nanocomposite resists comprising nanoparticles in a polymer matrix are provided in this invention. New chemically amplified resists that incorporate inorganic moieties as part of the polymer are presented herein, as are new chemically amplified resists that incorporate photoacid generating groups within the polymeric chain. Novel non-chemically amplified yet photosensitive resists, and new organic-inorganic hybrid resists are also provided herein. This invention and the embodiments described herein constitute fundamentally new architectures for high resolution resists.

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